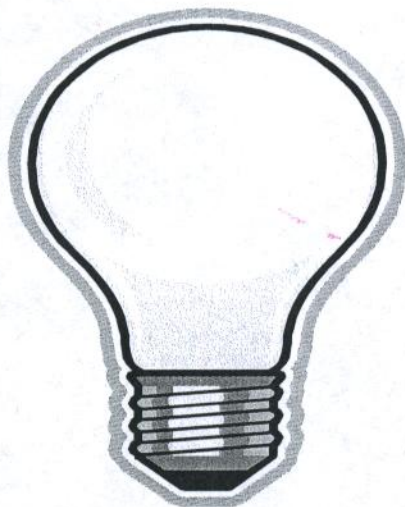


# **CIRCUIT CITY**



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**School- MLK  
Grade Level- 4th  
District- Christian Co.**

## Step 1: Identify your Purpose

# Statement of Purpose

### Kentucky Curriculum: Academic Expectations, Program of Studies, Core Content

#### What Standards will this work focus on?

**Academic Expectation 2.3** - Students identify and analyze systems and the ways their components work together or affect each other.

**Kentucky Core Content 4.1** - SC-04-4.6.3 Students will evaluate a variety of models/representations of electrical circuits (open, closed, series, and/or parallel) to

\*make predictions related to changes in the system;

\*compare the properties of conducting and non-conducting materials.

Electricity in circuits can produce light, heat, and sound. Electrical circuits require a complete conducting path through which an electrical current can pass. Analysis of a variety of circuit models creates an opportunity to make predictions about circuits, as well as to demonstrate an understanding of the concepts of open and closed circuits and basic conducting and non-conducting materials.

#### What do you want students to KNOW?

- \*Kinds of electrical circuits
- \*Basic conducting and non-conducting materials

#### What ATTITUDES or HABITS will students develop?

- \*Appreciation of the functions of electricity in daily life.

#### What do you want students to UNDERSTAND?

- Students will understand that:
- \*electrical energy can be used for a variety of purposes.
  - \*electrical systems share some common features
  - \*heat flows through different materials at different rates.

#### What SKILLS will students develop?

- \***demonstrate** open/closed circuits and series/parallel circuits
- \***analyze** models
- \***predict** changes
- \***compare** how heat is transferred through different materials
- \***predict/draw conclusions** about heat conductivity of materials



## What ESSENTIAL QUESTIONS will frame the learning?

How can the knowledge of electrical systems be important to you in everyday life?

How can a series circuit be like a city?

How can a parallel circuit be like a city?

Why is it important to know which materials are conductors and which are insulators?

### Step 2: Determine Your Culminating Assessment

## Culminating Assessment

**Hook:** Remember when the power went out at school? If it were to happen again, how could we create a source of light to work by?

### ASSESSMENT : TASK ROTATION

#### MASTERY

Construct an electrical circuit and describe how it works. Use content vocabulary in your description.

#### INTERPERSONAL

Explain why the knowledge of electrical circuits is important to your life. Use vocabulary and definitions in your explanation.

#### UNDERSTANDING

Analyze the circuit shown and prove why it is a closed circuit. Use content vocabulary and definitions.

#### SELF-EXPRESSIVE

Create a role play of an electrical circuit(s) using all components of the circuit(s). Use vocabulary and definitions in your role play.

### Determine Criteria

#### Criteria

#### MASTERY

Students will construct an electrical circuit and describe how it works. The description should name the circuit and use content vocabulary to describe how it works.

#### INTERPERSONAL

Student's explanation should tell why the knowledge of electrical circuits would be important in their life. The explanation should include content vocabulary and definitions.

#### UNDERSTANDING

Students will analyze the circuit shown. The analysis should use vocabulary and definitions to prove why the circuit is closed.

#### SELF-EXPRESSIVE

Students will create a role play that includes all of the components of an electrical circuit. The role play should include vocabulary and definitions.

**Step 3: Establish Your Essential, Important and Nice to Know Vocabulary**  
Identify your strategies for teaching vocabulary throughout the unit.

# Vocabulary

**Mapping the Vocabulary for the lesson/unit of study.**

**Brainstorm the words students need for the unit/lesson.**

## Essential to Know

- ❖ closed circuit
- ❖ open circuit
- ❖ series circuit
- ❖ parallel circuits
- ❖ conducting
- ❖ non-conducting

## Important to Know

- ❖ conductor
- ❖ insulator
- ❖ path

## Nice to Know



**Ask yourself how you will CODE the essential words?**

**C**onnect

- ☐ Word Wall
- ☐ See It, Say It, Show It, Store It
- ☐ Window Notes

**O**rganize

- ☐ Key Concepts Vocabulary Organizer

**D**eep

- ☐ Compare/Contrast

**Process**

**E**xercise

- ☐ Boggle
- ☐ Open Response

**and Elaborate**



## Step 4: Align Your Instruction to the Assessment and Standards Unit Blueprint

<p>Which students need accommodations?</p> <p>Students who are having difficulty distinguishing the 4 types of circuits.</p>	<p><b>FOYER</b></p> <p><b>How will your introduce the unit/lesson?</b></p> <p><u>Hook:</u> In our city, what would happen if the City Waste Department suddenly stopped collecting trash? What if the City Water Department closed, never to reopen? What would happen to all of the businesses in our city if just one closed down?</p> <p><u>Bridge:</u> The answers to these questions are similar to the definitions to series and parallel circuits.</p>	<p>How will you make accommodations for students' abilities and skills?</p> <p>Activities and concepts will be repeated through CODE lessons.</p>
<p><b>WORKROOM</b></p> <p><b>What will students do to practice?</b></p> <p>-Circuit Board Lesson</p> <p>-CODE Lessons</p> <p>-Website- <a href="http://www.brainpop.com">www.brainpop.com</a></p>	<p><b>LIBRARY</b></p> <p><b>What resources will you use?</b></p> <p>-Technology - Website <a href="http://www.brainpop.com">www.brainpop.com</a></p> <p>-Circuit boards</p> <p><b>What strategies or tools will you use to help acquire new learning?</b></p> <p>-Word Wall</p> <p>-See It, Say It, Show It, Store It</p> <p>-Window Notes</p> <p>-Key Vocabulary Concepts Organizer</p> <p>-Compare/Contrast Activities</p> <p>-Boggle</p>	<p><b>PORCH</b></p> <p><b>What will students do to look back on the learning?</b></p> <p>Students will reflect on what they have learned about electrical circuits and conducting/non-conducting materials. They will respond to the question "How will this knowledge be useful to you in the future?"</p>
<p><b>How will you make accommodations for students' styles?</b></p> <p>Student will be asked to complete the Mastery Task activity in the Task Rotation. They will choose 1 other task to complete. The teacher will check for understanding using these tasks.</p>	<p><b>KITCHEN</b></p> <p><b>How will you assess the understanding?</b></p> <p>-Task Rotation</p> <p>-Open Response Questions</p>	<p><b>How will you make accommodations for multiple intelligences?</b></p>

## Step 5: Sequence Your Activities and Lessons

# Lesson Sequence

Purpose	Lesson	Tools/Strategy	Product	Learning Style								
To connect students' knowledge with their own background knowledge.	Hook/Bridge	Think, Pair, Share	Oral Discussion	<table><tr><td>S</td><td>S</td></tr><tr><td>T</td><td>F</td></tr><tr><td>N</td><td>N</td></tr><tr><td>T</td><td>F</td></tr></table>	S	S	T	F	N	N	T	F
S	S											
T	F											
N	N											
T	F											
To establish essential / important vocabulary for Unit.	Discuss with students the vocabulary that we think is essential to the unit and words that are important to know. Create word cards to hang on wall.	Word Wall	Words on wall	<table><tr><td>S</td><td>S</td></tr><tr><td>T</td><td>F</td></tr><tr><td>N</td><td>N</td></tr><tr><td>T</td><td>F</td></tr></table>	S	S	T	F	N	N	T	F
S	S											
T	F											
N	N											
T	F											
Students will "connect" with essential vocabulary for unit.	Students participate in "See It, Say It...." activity for 4 types of electrical circuits.	See It, Say It, Show It, Store It	Student responses to "See It, Say It...." activity.	<table><tr><td>S</td><td>S</td></tr><tr><td>T</td><td>F</td></tr><tr><td>N</td><td>N</td></tr><tr><td>T</td><td>F</td></tr></table>	S	S	T	F	N	N	T	F
S	S											
T	F											
N	N											
T	F											
Students will "connect" with essential vocabulary for unit.	Students complete the "window notes" section on each type of circuit including definition and etch-a-sketch.	-Window Notes -Etch-a-Sketch	Notes and pictures	<table><tr><td>S</td><td>S</td></tr><tr><td>T</td><td>F</td></tr><tr><td>N</td><td>N</td></tr><tr><td>T</td><td>F</td></tr></table>	S	S	T	F	N	N	T	F
S	S											
T	F											
N	N											
T	F											
Students will evaluate a variety of models/representations of electrical circuits (open, closed, series, and/or parallel) to observe and make predictions related to changes in system.	Students observe and make predictions on types of electrical circuits using circuit boards. Make notes on observations.	Circuit board	Notes of observations	<table><tr><td>S</td><td>S</td></tr><tr><td>T</td><td>F</td></tr><tr><td>N</td><td>N</td></tr><tr><td>T</td><td>F</td></tr></table>	S	S	T	F	N	N	T	F
S	S											
T	F											
N	N											
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Students will "organize" essential vocabulary.	Students will distinguish between conducting and non-conducting materials used to complete electrical circuits.	Key Vocabulary Concepts Organizer	Key Vocabulary Concepts Graphic Organizer	<table><tr><td>S</td><td>S</td></tr><tr><td>T</td><td>F</td></tr><tr><td>N</td><td>N</td></tr><tr><td>T</td><td>F</td></tr></table>	S	S	T	F	N	N	T	F
S	S											
T	F											
N	N											
T	F											
To incorporate technology to meet standard SC-04-4.6.3	Students will view video on brainpop.com about light energy. Teacher will assist students on taking notes on important concepts in video.	www.brainpop.com	Notes from video	<table><tr><td>S</td><td>S</td></tr><tr><td>T</td><td>F</td></tr><tr><td>N</td><td>N</td></tr><tr><td>T</td><td>F</td></tr></table>	S	S	T	F	N	N	T	F
S	S											
T	F											
N	N											
T	F											
To analyze a variety of circuits.	Follow attached Compare / Contrast Lessons.	Compare / Contrast	Graphic organizer of choice	<table><tr><td>S</td><td>S</td></tr><tr><td>T</td><td>F</td></tr><tr><td>N</td><td>N</td></tr><tr><td>T</td><td>F</td></tr></table>	S	S	T	F	N	N	T	F
S	S											
T	F											
N	N											
T	F											
Review essential vocabulary to prepare for assessment.	With a partner, students will complete "Boggle" activity to prepare for open response.	Boggle	Boggle Worksheet	<table><tr><td>S</td><td>S</td></tr><tr><td>T</td><td>F</td></tr><tr><td>N</td><td>N</td></tr><tr><td>T</td><td>F</td></tr></table>	S	S	T	F	N	N	T	F
S	S											
T	F											
N	N											
T	F											

To assess knowledge of electrical circuits.	Students will demonstrate knowledge of types of circuits through open response question.	ORQ - "Electrical Circuits"		Student responses	<table><tr><td>ST</td><td>SF</td></tr><tr><td>NT</td><td>NF</td></tr></table>	ST	SF	NT	NF
ST	SF								
NT	NF								
To assess knowledge of conducting and non-conducting materials.	Students will demonstrate knowledge of conducting and non-conducting materials through open response question.	ORQ - "Hot Dogs and the Campfire"		Student responses	<table><tr><td>ST</td><td>SF</td></tr><tr><td>NT</td><td>NF</td></tr></table>	ST	SF	NT	NF
ST	SF								
NT	NF								
To assess unit through students' learning styles.	Students will be assessed on unit through their learning style. Students complete Mastery Task and one other task of their choice.	Task Rotation		Responses to Tasks	<table><tr><td>ST</td><td>SF</td></tr><tr><td>NT</td><td>NF</td></tr></table>	ST	SF	NT	NF
ST	SF								
NT	NF								
To reflect on unit.	Students will respond to prompt (See Porch)	Reflection		Student Reflection	<table><tr><td>ST</td><td>SF</td></tr><tr><td>NT</td><td>NF</td></tr></table>	ST	SF	NT	NF
ST	SF								
NT	NF								

**Designer: Angie Puckett**

**School: MLK**  
**District: Christian County**



# The Hot Dogs and the Campfire

Prompt: Two boys were cooking hot dogs over a hot campfire late one night for a bedtime snack. They used straight metal clothes hangers to cook their hot dogs. Before their hot dogs were ready, the boy's fingers started to burn holding the metal hangers.

- A. Explain why the boys hands began to burn from holding the coat hangers even though the hot dogs were cooking on the other end of the wires. Use your science vocabulary words in your explanation.
- B. Describe two ways the boys could have kept their hands from burning as they cooked their food. Again, use your science vocabulary words to describe how their hands do not get burned.

## SCORING GUIDE

<b>4</b>	Student gives correct answers for parts A and B. All explanations are clear and complete. There is evidence of clear understanding of the concept.
<b>3</b>	Student gives correct answers for parts A and B. Explanations are correct, but possibly vague. There is less evidence of clear understanding.
<b>2</b>	Student answers 1 (A or B) part of the question completely correct. There is some evidence of understanding.
<b>1</b>	Student gives only parts of correct answers. There is little evidence of understanding.
<b>0</b>	Response is totally incorrect or irrelevant (does not add any new information to the question).
<b>B</b>	No response



# Electric Circuits

Prompt: Sean was working on developing an electrical circuit. He knew that energy transfer depends on a closed circuit with a source, receiver, and connecting wires.

- A. Draw a closed electrical circuit that Sean might have created.
- B. Using your science vocabulary, explain why some sets of cheap Christmas Tree lights go out when one bulb quits working while more expensive sets of lights keep working with a bad bulb.

## SCORING GUIDE

<b>4</b>	Student gives correct answers for parts A and B. All explanations are clear and complete. There is evidence of clear understanding of the concept.
<b>3</b>	Student gives correct answers for parts A and B. Explanations are correct, but possibly vague. There is less evidence of clear understanding.
<b>2</b>	Student answers 1 (A or B) part of the question completely correct. There is some evidence of understanding.
<b>1</b>	Student gives only parts of correct answers. There is little evidence of understanding.
<b>0</b>	Response is totally incorrect or irrelevant (does not add any new information to the question).
<b>B</b>	No response





# Compare / Contrast

for  
Conducting / Non-Conducting Materials

CC# SC-04-4.6.3 Students will evaluate a variety of models/representations of electrical circuits (open, closed, series, and/or parallel) to compare the properties of conducting and non-conducting materials.

## DESCRIBE:

Students will distinguish between the properties of conducting and non-conducting materials.

- Complete Key Vocabulary Concept Map

## COMPARE:

Students will choose an organizer to compare the properties of conducting and non-conducting materials.

## CONCLUSION:

What are the main differences between conducting and non-conducting materials? Students discuss and answer the questions "Are the properties of conducting and non-conducting materials more alike or different?"

## APPLY:

Students will apply knowledge gained through ORQ entitled "Hot Dogs and the Campfire".

# Compare Contrast

for  
Series and Parallel Circuits

CC# SC-04-4.6.3 Students will evaluate a variety of models/representations of electrical circuits (open, closed, series, and/or parallel) to make predictions related to changes in the system.

## DESCRIBE:

Students will distinguish between the characteristics of series and parallel circuits.

## COMPARE:

Students will choose an organizer to compare the characteristics of series and parallel circuits.

## CONCLUSION:

Students will discuss and respond the questions "Are these two circuits more alike or different?"

## APPLY:

Students will apply knowledge of series and parallel circuits to open response entitled "Electrical Circuits".



# CODE Lessons

For  
Electrical Circuits  
Conducting / Non-Conducting Materials

Essential Vocabulary:

Series Circuit

Parallel Circuit

Conducting

Non-conducting

Important Vocabulary:

conductor

insulator

path

## CONNECT:

Word Wall – Definitions and examples of key content vocabulary words will be recorded on artifacts hanging on wall.

See It, Say It, Show It, Store It – Students will complete this activity on four different types of circuits.

Window Notes – Students will complete “window notes” section on each type of circuit, including definition and etch-a-sketch.

## ORGANIZE:

Key Vocabulary Concepts Organizer – Students will distinguish between the properties of conducting and non-conducting materials used to complete electrical circuits. Do the same for series/parallel circuits.

## DEEP PROCESSING:

Compare/Contrast – Students will choose an organizer to compare series/parallel circuits and another organizer to compare conducting / non-conducting materials. See attached lesson plan for Compare/Contrast.

## EXERCISE:

Boggle – Students will complete Boggle activity sheet with a partner to prepare for the ORQ's.

ORQ's – "Electrical Circuits"

"Hot Dogs and the Campfire"